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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,782	11/26/2003	Hangching Grant Wang	03-0459 (BOE 0456 PA)	9058

44702 7590 06/01/2006

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EXAMINER	
HOLZEN, STEPHEN A	

ART UNIT	PAPER NUMBER
3644	

DATE MAILED: 06/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/723,782	WANG ET AL.	
	Examiner	Art Unit	
	Stephen A. Holzen	3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/21/2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) *8,14-22,26,27 and 31-40* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7, 9-13, 23-25, 28-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 8, 14-22, 26, 27 and 31-40 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected embodiment, there being no allowable generic or linking claim. Election was confirmed as being elected **without** traverse in the reply filed on 3/27/2006.

2. Applicant has failed to use the proper status identifier procedure. The examiner did not specifically notice that applicant used an improper status identifier procedure until after reviewing applicant's arguments and studying the claim language of the independent claims. While the identifiers themselves are proper, their location is not proper. Status identifiers are to be listed AFTER the claim number. Not above, not below, but directly after the claim number.

For example: applicant should have written "Claim 1 (currently amended): A method...."

Failure to follow proper status identifier procedure in the future will result in a notice of non-compliance. In light of the fact that the examiner spent time considering applicant's arguments the examiner waived the status identifier procedural requirements in favor of advancing prosecution. Should applicant fail to follow proper status identifier procedure in the future the applicant will receive a notice of non-compliance.

Response to Arguments

3. Applicant's arguments filed 3/21/2006 have been fully considered but they are not persuasive.

4. Regarding Patouraux: Applicant has argued that the method claims requires that yaw be measured by sensors. The examiner disagrees. The claims require a yaw measurement from attitude sensors (which could be roll and pitch sensors). The claims do not require that yaw measurements come from yaw sensors. Since applicant's arguments are outside the scope of the claims, these arguments are moot.

5. Applicant has argued that the methods defined in the claims are completely different than those disclosed by Horton. These statements are conclusatory, and do not elaborate on why Horton's method steps are different than applicant's claims.

Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

The examiner believes the step of sensing attitude by measuring acceleration with accelerometers in 3-axis measurements, and the step of measuring angular rates with angle rate sensors to compute attitude to anticipate "measuring yaw attitude measured by attitude sensor and a second yaw attitude estimated by gyro compassing".

Claim Objections

6. Claims 3, 4, 11 and 12 are objected to because of the following informalities:

Re – Claims 3 and 4: The examiner thinks that the phrase "adjust update gain" may be more clearly written as "adjusting an update gain". The applicant is required to either amend or clarify the meaning of this phrase.

Re – Claim 11 and 12: The examiner cannot determine if the yaw measurements are sampled a plurality of times or there is a plurality of samples taken only at the "beginning portion". Applicant should clarify the meaning of these claims.

DETAILED ACTION

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 6, 7, 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Patouraux (6,804,986). Patouraux discloses a method for controlling satellites, especially geostationary satellites. Patouraux does not provide a sensor for measuring the yaw angle and discloses that the yaw angle is usually estimated and controlled by means of the roll/yaw coupling that occurs throughout the orbit when an angular momentum bias is present on the spacecraft. (See Col. 1, lines 19-24). Patouraux's method is based on direct measurement of the yaw angle purely based on

the geometry of the sensor (the method does not require long data collection period but only needs two measurements on two sensors to infer a yaw angle). The first yaw determination is made on the reference orbit and the second is made on the second orbit. (See col. 10, lines 8-15). The final orientation depends on the order of rotation: if the yaw/pitch/roll orders of rotation is picked then the final attitude is reached by first rotating the frame around the yaw axis, then rotating around the new pitch axis and then around the new roll axis. (See Col. 4, lines 15-20). The roll and pitch errors of at least one of the sensor are sent to the on-board processor for roll and pitch control (see Col. 4, lines 55-60). When a yaw error exists (as illustrated in Figure 4) the direction in which roll and pitch errors are measure would be canted by y. (See Col. 5, lines 7-8).

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-7, 9-13, 23-25, 28-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Horton (6,853,947). Horton discloses a method that sense the attitude of a satellite by measuring acceleration with accelerometers and gyroscopes, then determines corrective rate signals to reduce residual drift. Horton teaches that it is known to use different methods for generating corrective rate signals such as with a

Kalman Filter or with fixed gains scheduling. Figure 3 illustrates that a corrective rate for the yaw axis acceleration may be generated based upon the measurements of the sensors 18a-18c. Horton further discloses that temperature corrections can be digitally incorporated into the data output (see Col. 6, lines 28-31). Figure 6 illustrates a step of obtaining and setting the correction factors and is designed to adaptively estimate the correction factors of sensors and their measurements. Horton discloses a state model that predicts where the attitude errors and rate sensor bias states will propagate based on input data from the rate sensors and the measurement model corrects this prediction with real attitude error measurements obtained from the sensors and uses the Kalman filter to correct the trajectory calculated by the processor #61 (see Col. 13, lines 37-44).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen A. Holzen whose telephone number is 571-272-6903. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teri Luu can be reached on 571-272-7045. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sah

Robert P. Swiatek

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